



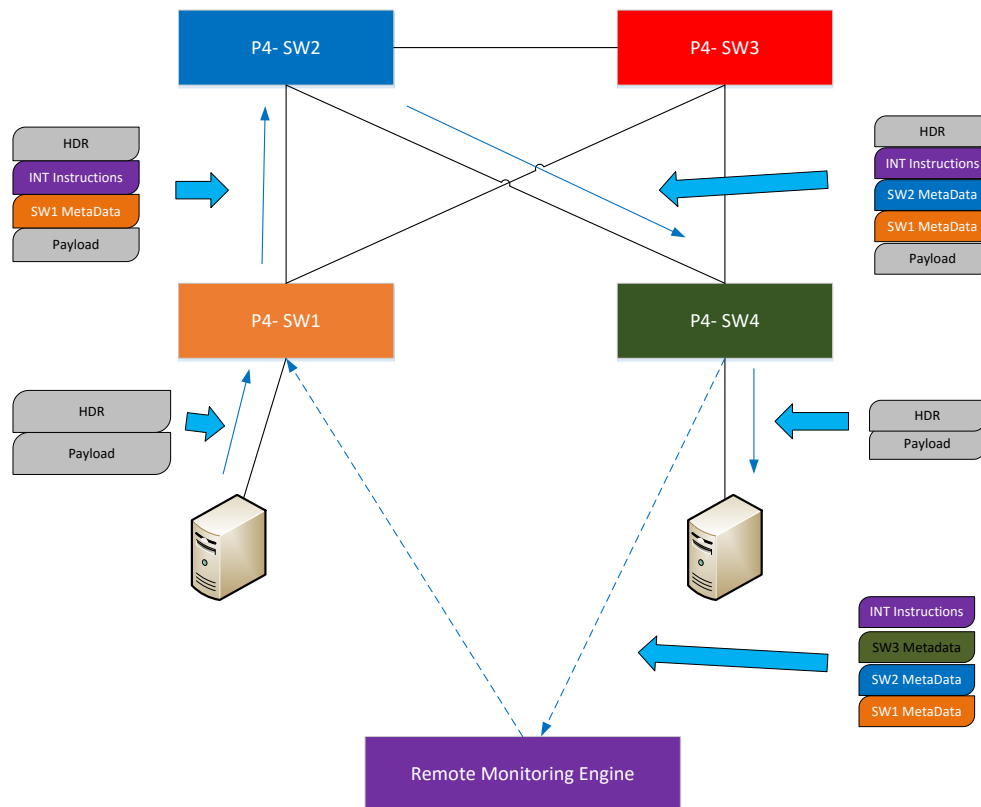
In-band Network Telemetry (INT) on Software Switch Programmed by P4

Abstract:

In-band Network Telemetry (INT) is a new framework designed to allow the collection and reporting of network state, by the data plane, without requiring intervention of additional control plane protocols. Data packets are instrumented with INT header fields that contain “Telemetry Instructions” to INT-capable network device. The instructions tell the devices what Telemetry data to collect and the collected data is written into the forwarded data packets.

INT data that can be collected includes: switch IDs, Input/Output Port IDs, Hop Latency, Queue Occupancy, In/Out Timestamps and more. Such telemetry data provides immense value in networks in general. It enables real-time debugging of network issues as well as “self healing” networks.

Programming Protocol-independent Packet Processor (P4) is a high-level language that can be deployed in the future into Software Defined Networks (SDN) and can actually serve as an alternative to OpenFlow that is currently used – due to its flexibility and ability to support emerging new protocols such as INT.





Goals:

- Program a P4 Software Switch based on simple-router model that supports INT over VxLAN or NSH – as described in <http://p4.org/wp-content/uploads/fixed/INT/INT-current-spec.pdf>
- If NSH is used – refer to latest IETF draft per <https://tools.ietf.org/html/draft-ietf-sfc-nsh-09>
- Build over Mininet a topology of 4 P4 SW switches
- Generate traffic with Scapy and monitor Latency / BandWidth
- Bonus: Integrate with ONOS – Refer to: <https://wiki.onosproject.org/display/ONOS/P4+Experimental+Support+via+BMv2;jsessionid=0871B0D8948B400D12A78C7BAA4AF36C>

Requirements:

Internet Networking Course